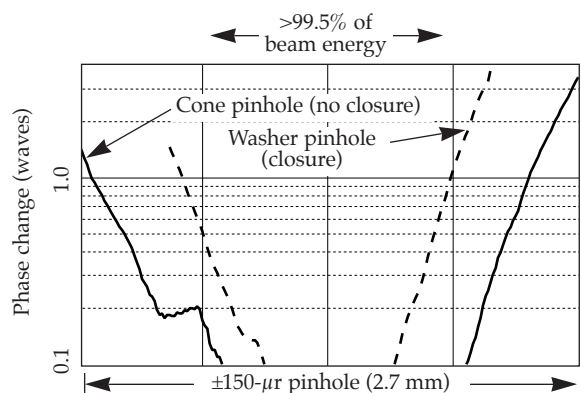


NIF Bids Opened; Mammoth Bones Found. Bids from three companies were opened this month to reveal their fixed prices for completion of the NIF Laser Building. Within the next few weeks the NIF Project Team will review the bids in detail to determine whether they respond properly to the bid package and are in conformity with all requirements. Meanwhile, on Dec. 15, a worker at the NIF construction site found the jaw bone of a mammoth. DOE and LLNL have decided to remove and preserve as much of this paleontological find as possible without substantial negative impact to the NIF project schedule.



The NIF construction site (December 1997) has been called the largest excavation area in the San Francisco East Bay.

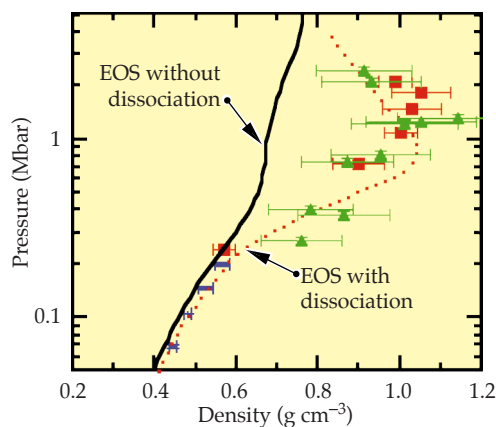
New Pinhole for NIF Spatial Filters. Beamlet measurements have demonstrated a new pinhole design for use on the NIF spatial filters. Spatial filter pinholes "clean up" beams by blocking beam power at the high spatial frequencies. However, the blocked beam power generates plasma, which can expand into the pinhole and disrupt the transmitted beam for multi-nanosecond pulses. The new pinhole is a truncated cone, with the larger opening facing the beam. The



A snapshot of plasma-induced phase change at the end of a "NIF ignition laser pulse" for two different pinhole designs.

high-angle conical surfaces are designed to reflect and refract rather than absorb unwanted beam power, holding the plasma generation to low levels and thus keeping the hole "open" for a longer period of time. The phase change at the end of the pulse and near the edge of the pinhole (solid curves in figure) is significantly less than that observed during pinhole closure (dashed curves), as measured in earlier experiments with a different pinhole design. The Beamlet experiments showed that a $\pm 150\text{-}\mu\text{m}$ (2.7-mm-diam) stainless-steel cone pinhole remained open for the full duration of a 20-ns NIF ignition pulse.

Nova Studies of Liquid Deuterium. Using a velocity interferometer, we have improved the accuracy of the shock-speed measurement to better than 1%, and we simultaneously measured for the first time the reflectivity of shock-compressed deuterium. We also implemented a temperature diagnostic that made the first temperature measurements of shock-compressed deuterium in the megabar regime. The results below (green triangles) confirm the earlier Nova data (red squares) as to the important role that molecular dissociation plays in the equation of state (EOS) of hydrogen and its isotopes.



Measured and calculated Hugoniot for liquid deuterium. Blue bars are earlier gas-gun data; green triangles/red squares are Nova data.

APS-DPP Papers Presented. LLNL ICF scientists presented 90 papers at the 39th annual meeting of the Division of Plasma Physics (DPP) of the American Physical Society (APS) in Pittsburgh, Pennsylvania, between November 17 and November 21. Of the 90 papers, 8 were invited papers. Many of the contributed papers were co-authored with other LLNL division scientists and other national ICF Program researchers. Abstracts of these papers can be viewed at LLNL's documents-on-line electronic library at http://www.llnl.gov/tid/lof/lof_home.html by searching for the last name of the paper's first author.